# A MIOCENE MOLLUSK OF THE GENUS HALIOTIS FROM THE TEMBLOR RANGE, CALIFORNIA [1]

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Among the many unrecorded lots of California Tertiary fossils in the national collections is one obtained by Robert Anderson and R. W. Pack in 1909 in the hills along the west edge of the southern Temblor Range adjoining Elkhorn Plain, which lies on the northeast side of the San Andreas rift in eastern San Luis Obispo County, Calif. This collection contains 20 specimens of *Haliotis*. Though very little shell substance is preserved, the material is far better than the three imperfect specimens on which *Haliotis palaea*,[2] the first American Miocene species to be described, was based. The relative abundance of a genus so rare in the fossil state made an impression on the collectors—an impression so lasting that Mr. Pack on seeing the account of *Haliotis palaea* recalled their find and wrote to me concerning it.

In the description of *Haliotis palaea* attention was drawn to the rarity of *Haliotis* and of most other rock-clinging shells as fossils. Its relative abundance at the locality discovered by Messrs. Anderson and Pack hardly affords a basis for altering that view. It is estimated that the total number of Miocene shells that have been collected in California runs into the tens of thousands and that the number of localities is in the thousands, yet exactly 23 specimens of *Haliotis* have so far turned up, and they have been found at 2 localities. The other fossils collected at the Temblor Range locality give no clue as to the unusual conditions that favored the rapid burial of the abalone shells, and no observations are available as to the rocky headlands on which they lived.

## Genus HALIOTIS Linnaeus

*Haliotis* Linnaeus, Syst. Nat., ed. 10, p. 779, 1758.

*Type* (by subsequent designation, Montfort, Conch. Syst., vol. 2, p. 119, 1810).—*Haliotis asininus* Linnaeus (emendation for *asinina*), recent, Indo-Pacific.

[1] Published with the permission of the Director of the U. S. Geological Survey.

[2] Woodring, W. P., A Miocene *Haliotis* from southern California. Journ. Pal., vol. 5, no. 1, pp. 34–39, pl. 6, 1931.

When I commented on Montfort's designation of the least "typical" of the known species as the type species of *Haliotis*, Iredale's [3] remarks on the same subject were overlooked. Iredale considered *asinina* worthy of separate generic rank. If this view is adopted, I would be in favor of appealing for special protection for the name *Haliotis*, as Iredale later intimated is desirable.[4] The ruthless suppression or transferral of familiar names on the grounds of a rigid application of the principle of subsequent designation is very unfortunate.

An unidentified and uncollected *Haliotis* has been recorded from New Zealand beds that are referred to the upper Oligocene.[5] If the age is correctly determined, this is the earliest undoubted *Haliotis* to be recorded.

### HALIOTIS LASIA, new species

PLATE 1

*Description.*—A relatively small, long-ovate, flat *Haliotis* bearing an indeterminate number of open holes (11 to 13 projections are visible on the molds, but some of the earliest represent closed holes). The spire is submarginal. A shallow depression lies along the columellar margin. Above it lies a bulge, which is followed by another shallow depression adjoining the row of holes. Sculpture consisting of slightly undulatory spiral cords of rather uniform width separated by narrow deep grooves. Coarse axial wrinkles are visible on some specimens.

The dimensions of the four largest specimens are as follows:

| Length | Width |
|---|---|
| *Millimeters* | *Millimeters* |
| 75 | 51.5 (holotype) |
| 65.5 | 44.5 |
| 49.5 | 32.8 |
| 46 | 32.3 |

*Type material.*—Holotype (U.S.N.M. No. 371767), figured, and 19 paratypes (U.S.N.M. Nos. 371768, 371769), 4 of which are figured.

*Type (and only) locality.*—Southwest edge of Temblor Range, adjoining Elkhorn Plain, San Luis Obispo County, Calif., NW. ¼ SW. ¼ sec. 6, T. 32 S., R. 22 E., about 200 yards up first western fork of canyon leading toward SW. cor. sec. 6, southwest of 2,800-foot hill between forks, R. Anderson and R. W. Pack, collectors,

[3] Iredale, Tom, On some misapplied molluscan generic names. Proc. Malac. Soc. London, vol. 9, p. 260, 1911.

[4] *In* Finlay, H. J., A further commentary on New Zealand molluscan systematics. Trans. New Zealand Inst., vol. 57, p. 341, 1926.

[5] Powell, A. W. B., and Bartrum, J. A., The Tertiary (Waitematan) molluscan fauna of Oneroa, Waiheke Island. Trans. New Zealand Inst., vol. 60, p. 445, 1929.

June 21, 1909 (U. S. Geol. Survey Loc. No. 12453); Santa Margarita (?) formation, upper Miocene.

*Remarks.*—The 20 specimens are molds, all of which are more or less imperfect. A few retain traces of shell material. One is a little more convex than others.

The long-ovate outline and submarginal spire suggest that this species belongs in the group of *H. tuberculata* Linnaeus, as defined by Pilsbry,[6] but it closely resembles a small elongate *Haliotis* from San Benito Island off Lower California (U.S.N.M. No. 265600), that has the wide, uniformly spaced, rounded spiral cords and deep narrow grooves of *H. fulgens* Philippi, which belongs in the group of *H. corrugata.* More specimens are needed to determine whether the Lower California *Haliotis* is an elongate form of *fulgens* or whether the similarity of sculpture is attributable to parallelism. The fossils have more uniformly spaced spiral threads and are smaller than *H. walallensis* Stearns,[7] which seems to be a genuine California representative of the *tuberculata* group. In outline and size they resemble the Japanese *H. japonica* Reeve (*tuberculata* group), which lacks the bulge and depression between the columellar margin and the row of holes. Young specimens of the Californian *H. rufescens* Swainson (*corrugata* group) are more elongate than adults, but their surface is undulated by coarse waves, and they have less uniform sculpture and less strongly developed bulge and depression.

The sandstone carrying *Haliotis lasia* was placed in the Santa Margarita formation by the collectors. According to the field notes, it is part of a zone of conglomerate and sandstone, and lies about 200 feet above a bed carrying an echinoid identified by Anderson and Pack as *Astrodapsis antiselli* Conrad, provided the beds are not overturned, though the two sets of beds were not found in a continuous section. W. D. Kleinpell, of Bakersfield, Calif., who is familiar with the geology of the southern Temblor Range, has kindly examined this locality and reports that the beds are not overturned. According to Mr. Kleinpell, in the Salinas Valley *Astrodapsis antiselli* is found above the Santa Margarita formation (upper Miocene) in the lower part of Reed's[8] Poncho Rico formation, which may straddle the Miocene-Pliocene boundary in terms of the California Coast Range section as now accepted. Therefore, the Temblor Range *Haliotis*-bearing bed may be younger than the

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[6] Pilsbry, H. A., Man. Conch., vol. 12, pp. 76, 85, 1890.

[7] Stearns, Robert E. C., Preliminary description of a new variety of *Haliotis*. Nautilus, vol. 12, no. 9, pp. 106–107, 1899. Description of a new variety of *Haliotis* from California, with faunal and geographical notes. Proc. U. S. Nat. Mus., vol. 22, pp. 139–142, 1900.

Dall, W. H., U. S. Nat. Mus. Bull. 112, pl. 22, 1921.

[8] Reed, R. D., The post-Monterey disturbance in the Salinas Valley, Calif. Journ. Geol., vol. 33, no. 6, pp. 591, 603, 606, 1925.

Santa Margarita formation, but it is questionably referred to it and is tentatively considered of late upper Miocene age.

If the stage of evolution as to size and bulging petals attained by *Astrodapsis antiselli* as compared with the small flat-petaled astrodapses collected in the Santa Monica Mountains at the type locality of *Haliotis palaea* means anything, *H. lasia* is considerably younger than *palaea*, though both are referred to the upper Miocene. These two species are not at all similar to each other.

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